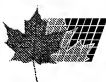


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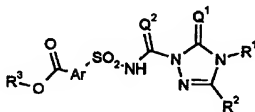


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(86) 1996/07/04
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A01N 47/38, C07D 405/14, C07D 401/14
(30) 1995/07/17 (195 25 974.2) DE
(54) **ARYLSULFONYLAMINO(THIO)CARBONYL TRIAZOLIN(THI)ONES SUBSTITUEES**
(54) **SUBSTITUTED ARYL SULPHONYL AMINO (THIO) CARBONYL TRIAZOLIN(THI)ONES**

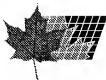


(I)

(57) L'invention concerne de nouvelles arylsulfonylamino(thio)carbonyl triazolin(thi)ones substituées de la formule (I) où Ar représente arylène ou hétéro-arylène éventuellement substitués ; Q¹ représente oxygène ou soufre ; Q² représente oxygène ou soufre ; R¹ représente hydrogène, hydroxy, amino, alkylidénamino ou un reste éventuellement substitué de la série alkyle, alcényle, alcynyle, alcoxy, alcényloxy, alkylamino, dialkylamino, alcanoylamino, cycloalkyle, cycloalkylalkyle, aryle, arylalkyle ; R² représente hydrogène, hydroxy, mercapto, amino, halogène ou un reste éventuellement substitué de la série alkyle, alcényle, alcynyle, alcoxy, alcényloxy, alcynylloxy,

(57) The invention relates to novel substituted aryl sulphonyl amino (thio) carbonyl triazolin(thi)ones of formula (I) in which Ar is possibly substituted arylene or heteroarylene; Q¹ is oxygen or sulphur; Q² is oxygen or sulphur; R¹ is hydrogen, hydroxy, amino, alkylidene amino or a possibly substituted radical from the series alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkylamino, dialkylamino, alkanoylamino, cycloalkyl, cycloalkyl alkyl, aryl, arylalkyl; R² is hydrogen, hydroxy, mercapto, amino, halogen or a possibly substituted radical from the series alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkylthio, alkenylthio, alkynylthio, alkylamino, alkenylamino, alkynylamino,





(21) (A1) **2,227,012**
(86) 1996/07/04
(87) 1997/02/06

alkylthio, alcénylthio, alcynylthio, alkylamino, alcénylamino, alcynylamino, dialkylamino, alcanoylamino, aziridino, pyrrolidino, pipéridino, morpholino, cycloalkyle, cycloalcényle, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkyle, cycloalkylalcoxy, cycloalkylalkylthio, cycloalkylalkylamino, aryle, aryloxy, arylthio, arylamino, arylalkyle, arylalcoxy, arylalkylthio, arylalkylamino, hétérocyclyloxy, hétérocyclylthio ou bien R^1 et R^2 représentent conjointement alcandiyle éventuellement ramifié et R^3 représente hétérocyclyle éventuellement substitué. L'invention concerne également les sels des composés de la formule (I), le procédé de production des nouveaux composés et leur utilisation comme herbicides.

dialkylamino, alkanoylamino, aziridino, pyrrolidino, piperidino, morpholino, cycloalkyl, cycloalkenyl, cycloalkoxy, cycloalkylthio, cycloalkylamino, cycloalkyl alkyl, cycloalkyl alkoxy, cycloalkyl alkylthio, cycloalkyl alkylamino, aryl, aryloxy, arylthio, arylamino, arylalkyl, arylalkoxy, arylalkylthio, arylalkylamino, heterocyclyloxy, heterocyclylthio; or R^1 and R^2 together are possibly branched alkandiyl; and R^3 is possibly substituted heterocyclyl; and salts of the compounds of formula (I), process for producing the novel compounds and their use as herbicides.

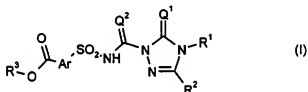
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(21) Internationales Aktenzeichen: PCT/EP96/02932		[DE/DE]; Burscheider Strasse 154b, D-51381 Leverkusen (DE), SANTEL, Hans-Joachim [DE/DE]; Grünstrasse 9a, D-51371 Leverkusen (DE).	
(22) Internationales Anmeldedatum: 4. Juli 1996 (04.07.96)		(74) Gemeinsamer Vertreter: BAYER AKTIENGESELLSCHAFT, D-51368 Leverkusen (DE).	
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(54) Title: SUBSTITUTED ARYL SULFONYL AMINO (THIO) CARBONYL TRIAZOLIN(THI)ONES			
(54) Bezeichnung: SUBSTITUIERTE ARYLSULFONYLAMINO(THIO)CARBONYLTRIAZOLIN(THI)ONE			
(57) Abstract			
<p>The invention relates to novel substituted aryl sulphonyl amino (thio) carbonyl triazolin(thi)ones of formula (I) in which Ar is possibly substituted arylene or heteroarylene; Q¹ is oxygen or sulphur; Q² is oxygen or sulphur; R¹ is hydrogen, hydroxy, amino, alkylidene amino or a possibly substituted radical from the series alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkylamino, dialkylamino, alkanoylamino, cycloalkyl, cycloalkyl alkyl, aryl, arylalkyl; R² is hydrogen, hydroxy, mercapto, amino, halogen or a possibly substituted radical from the series alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkinyloxy, alkylthio, alkenylthio, alkinyloxy, alkylamino, alkenylamino, dialkylamino, alkanoylamino, aziridino, pyrrolidino, piperidino, morpholino, cycloalkyl, cycloalkenyl, cycloalkoxy, cycloalkylthio, cycloalkylamino, cycloalkyl alkyl, cycloalkyl alkoxy, cycloalkyl alkylthio, cycloalkyl alkylamino, aryl, aryloxy, arylthio, arylamino, arylalkyl, arylalkoxy, arylalkylthio, arylalkylamino, heterocycloxy, heterocyclylthio; or R¹ and R² together are possibly branched alkandiyl; and R³ is possibly substituted heterocyclyl; and salts of the compounds of formula (I), process for producing the novel compounds and their use as herbicides.</p>			
(57) Zusammenfassung			
<p>Die Erfindung betrifft neue substituierte Arylsulfonylamino(thio)carbonyltriazolin(thi)one der Formel (I), in welcher Ar für jeweils gegebenenfalls substituiertes Arylen oder Heteroarylen steht, Q¹ für Sauerstoff oder Schwefel steht, Q² für Sauerstoff oder Schwefel steht, R¹ für Wasserstoff, Hydroxy, Amino, Alkylidenamino oder für einen jeweils gegebenenfalls substituierten Rest aus der Reihe Alkyl, Alkenyl, Alkynyl, Alkoxy, Alkenyloxy, Alkinyloxy, Alkylamino, Dialkylamino, Alkanoylamino, Cycloalkyl, Cycloalkylalkyl, Aryl, Arylalkyl steht, R² für Wasserstoff, Hydroxy, Mercapto, Amino, Halogen oder für einen jeweils gegebenenfalls substituierten Rest aus der Reihe Alkyl, Alkenyl, Alkynyl, Alkoxy, Alkenyloxy, Alkinyloxy, Alkylthio, Alkenylthio, Alkinyloxy, Alkylamino, Alkenylamino, Dialkylamino, Alkanoylamino, Aziridino, Pyrrolidino, Piperidino, Morpholino, Cycloalkyl, Cycloalkenyl, Cycloalkoxy, Cycloalkylthio, Cycloalkylamino, Cycloalkylalkyl, Cycloalkylalkoxy, Cycloalkylalkylthio, Cycloalkylalkylamino, Aryl, Aryloxy, Arylthio, Arylamino, Arylalkyl, Arylalkoxy, Arylalkylthio, Arylalkylamino, Heterocycloxy, Heterocyclylthio steht, oder R¹ und R² zusammen für gegebenenfalls verzweigtes Alkandiyl stehen, und R³ für gegebenenfalls substituiertes Heterocyclyl steht, sowie Salze der Verbindungen der Formel (I), Verfahren zur Herstellung der neuen Verbindungen und deren Verwendung als Herbizide.</p>			

Substituted arylsulphonylamino(thio)carbonyltriazolin(e-thi)ones

The invention relates to novel substituted arylsulphonylamino(thio)carbonyltriazolin(e-thi)ones, to a plurality of processes for their preparation and to their use as herbicides.

It is already known that certain sulphonylaminocarbonyltriazolinones have herbicidal properties (cf. EP-A 341489, EP-A 422469, EP-A 425948, EP-A 431291, EP-A 507171). However, the activity of these compounds is not satisfactory in every respect.

This invention, accordingly, provides the novel substituted arylsulphonylamino(thio)carbonyltriazolin(e-thi)ones of the general formula (I)



10 in which

Ar represents respectively optionally substituted arylene or heteroarylene,

Q¹ represents oxygen or sulphur,

Q² represents oxygen or sulphur,

15 R¹ represents hydrogen, hydroxyl, amino, alkylideneamino or represents a respectively optionally substituted radical from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkylamino, dialkylamino, alkanoylamino, cycloalkyl, cycloalkylalkyl, aryl, arylalkyl,

20 R² represents hydrogen, hydroxyl, mercapto, amino, halogen or represents a respectively optionally substituted radical from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkinyloxy, alkylthio, alkenylthio, alkynyl-

Ex 1 31216-PC

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- thio, alkylamino, alkenylamino, alkynylamino, dialkylamino, alkanoylamino, aziridino, pyrrolidino, piperidino, morpholino, cycloalkyl, cycloalkenyl, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkyl, cycloalkylalkoxy, cycloalkylalkylthio, cycloalkylalkylamino, aryl, aryloxy, arylthio, arylamino, arylalkyl, arylalkoxy, arylalkylthio, arylalkylamino, heterocyclyloxy, heterocyclylthio, or

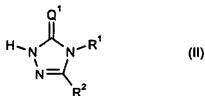
R¹ and R² together represent optionally branched alkanediyl, and

R³ represents optionally substituted heterocyclyl,

and salts of the compounds of the formula (I).

- 10 The novel substituted arylsulphonylamino(thio)carbonyl-triazolin(e-thi)ones of the general formula (I) are obtained when

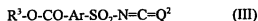
(a) triazolin(e-thi)ones of the general formula (II)



in which

- 15 Q¹, R¹ and R² are each as defined above

are reacted with substituted arylsulphonyliso(thio)cyanates of the general formula (III)



in which

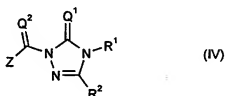
- 3 -

Ar, Q² and R³ are each as defined above,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

or

- 5 (b) triazolin(e-thi)one derivatives of the general formula (IV)

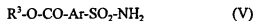


in which

Q¹, Q², R¹ and R² are each as defined above and

Z represents halogen, alkoxy, aryloxy or arylalkoxy

- 10 are reacted with sulphonamides of the general formula (V)



in which

Ar and R³ are each as defined above,

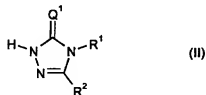
if appropriate in the presence of an acid acceptor and if appropriate in the presence of a diluent,

15

or

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(c) triazolin(e-thi)ones of the general formula (II)



in which

Q¹, R¹ and R² are each as defined above

5 are reacted with substituted arylsulphonamide derivatives of the general formula (VI)



in which

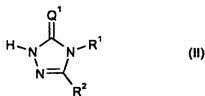
Ar, Q² and R³ are each as defined above and

Z represents represents halogen, alkoxy, aryloxy or arylalkoxy,

10 if appropriate in the presence of an acid acceptor and if appropriate in the presence of a diluent,

or

(d) triazolin(e-thi)ones of the general formula (II)

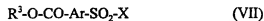


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in which

Q^1 , R^1 and R^2 are each as defined above

are reacted with substituted arylsulphonyl halides of the general formula (VII)

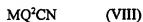


5 in which

Ar and R^3 are each as defined above and

X represents halogen

and metal (thio)cyanates of the general formula (VIII)



10 in which

Q^2 is as defined above and

M represents an alkali metal or an alkaline earth metal equivalent,

if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

15 and, if appropriate, the compounds of the formula (I) obtained by the processes (a), (b), (c) or (d) are converted into salts by customary methods.

The novel sulphonylamino(thio)carbonyl-triazolin(e-thi)ones of the general formula (I) have strong herbicidal activity.

The invention preferably provides compounds of the formula (I) in which

- Ar represents phenylene or naphthylene, each of which is optionally substituted by halogen, cyano, nitro, by C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, di-(C₁-C₄-alkyl)-amino-sulphonyl or N-C₁-C₄-alkoxy-N-C₁-C₄-alkyl-amino-sulphonyl (each of which is optionally substituted by fluorine and/or chlorine), or represents heteroarylene of 5 or 6 ring members, at least one of which is oxygen, sulphur or nitrogen and one or two more are optionally nitrogen, which is optionally substituted by halogen, cyano, nitro, by C₁-C₄-alkyl or C₁-C₄-alkoxy (each of which is optionally substituted by fluorine and/or chlorine),
- Q¹ represents oxygen or sulphur,
- Q² represents oxygen or sulphur,
- R¹ represents hydrogen, hydroxyl, amino, represents C₂-C₁₀-alkylideneamino, represents optionally fluorine-, chlorine-, bromine-, cyano-, C₁-C₄-alkoxy-, C₁-C₄-alkyl-carbonyl- or C₁-C₄-alkoxy-carbonyl-substituted C₁-C₆-alkyl, represents respectively optionally fluorine-, chlorine- and/or bromine-substituted C₂-C₆-alkenyl or C₂-C₆-alkinyl, represents respectively optionally fluorine-, chlorine-, cyano-, C₁-C₄-alkoxy- or C₁-C₄-alkoxy-carbonyl-substituted C₁-C₆-alkoxy, C₁-C₆-alkylamino or C₁-C₆-alkanoylamino, represents C₃-C₆-alkenyloxy, represents di-(C₁-C₄-alkyl)-amino, represents respectively optionally fluorine-, chlorine-, bromine-, cyano- and/or C₁-C₄-alkyl-substituted C₃-C₆-cycloalkyl or C₃-C₆-cycloalkyl-C₁-C₄-alkyl, or represents respectively optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C₁-C₄-alkyl-, trifluoromethyl- and/or C₁-C₄-alkoxy-substituted phenyl or phenyl-C₁-C₄-alkyl,
- R² represents hydrogen, hydroxyl, mercapto, amino, fluorine, chlorine, bromine, iodine, represents optionally fluorine-, chlorine-, bromine-, cyano-, C₁-C₄-alkoxy-, C₁-C₄-alkyl-carbonyl- or C₁-C₄-alkoxy-carbonyl-substituted C₁-C₆-alkyl,

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represents respectively optionally fluorine-, chlorine- and/or bromine-substituted C₂-C₆-alkenyl or C₂-C₆-alkinyl, represents respectively optionally fluorine-, chlorine-, cyano-, C₁-C₄-alkoxy- or C₁-C₄-alkoxy-carbonyl-substituted C₁-C₆-alkoxy, C₁-C₆-alkylthio, C₁-C₆-alkylamino or C₁-C₆-alkanoylamino, represents

5 C₂-C₆-alkenylloxy, C₂-C₆-alkinylloxy, C₂-C₆-alkenylthio, C₂-C₆-alkinylthio, C₂-C₆-alkenylamino or C₂-C₆-alkinylamino, represents di-(C₁-C₄-alkyl)-amino, represents respectively optionally methyl- and/or ethyl-substituted aziridino, pyrrolidino, piperidino or morpholino, represents respectively optionally fluorine-, chlorine-, bromine-, cyano- and/or C₁-C₄-alkyl-substituted C₃-C₆-cycloalkyl, C₃-C₆-cycloalkenyl, C₃-C₆-cycloalkylloxy, C₃-C₆-cycloalkylthio, C₃-C₆-cycloalkylamino, C₃-C₆-cycloalkyl-C₁-C₄-alkyl, C₃-C₆-cycloalkyl-C₁-C₄-alkoxy, C₃-C₆-cycloalkyl-C₁-C₄-alkylthio or C₃-C₆-cycloalkyl-C₁-C₄-alkylamino, or represents respectively optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C₁-C₄-alkyl-, trifluoromethyl- and/or C₁-C₄-alkoxy-substituted substituted

10 phenyl, phenyl-C₁-C₄-alkyl, phenoxy, phenyl-C₁-C₄-alkoxy, phenylthio, phenyl-C₁-C₄-alkylthio, phenylamino or phenyl-C₁-C₄-alkylamino, or represents respectively optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C₁-C₄-alkyl-, trifluoromethyl- and/or C₁-C₄-alkoxy-substituted heterocyclyloxy or heterocyclylthio, the heterocyclyl component being in each case selected from

15 the group consisting of oxiranyl, oxetanyl, furyl, tetrahydrofuryl, thietanyl, thienyl, tetrahydrothienyl, or

20

R¹ and R² together represent optionally branched alkanediyl having 3 to 11 carbon atoms, and

R³ represents respectively optionally halogen- or C₁-C₄-alkyl-substituted oxetanyl, thietanyl, furyl, tetrahydrofuryl, thienyl or tetrahydrothienyl.

25

Furthermore, the invention preferably provides the sodium, potassium, magnesium, calcium, ammonium, C₁-C₄-alkyl-ammonium, di-(C₁-C₄-alkyl)-ammonium, tri-(C₁-C₄-alkyl)-ammonium, tetra-(C₁-C₄-alkyl)-ammonium, tri-(C₁-C₄-alkyl)-sulphonium, C₅- or C₆-cycloalkyl-ammonium and di-(C₁-C₂-alkyl)-benzyl-ammonium salts of compounds

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of the formula (I) in which Ar, Q¹, Q², R¹, R² and R³ are each as defined above by way of preference.

The invention in particular provides compounds of the formula (I) in which

- 5 Ar represents respectively optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, methyl-, ethyl-, n- or i-propyl-, trifluoromethyl-, methoxy-, ethoxy-, difluoromethoxy-, trifluoromethoxy-, methylthio- or ethylthio-substituted 1,2-phenylene (ortho-phenylene), pyridine-2,3-diyl, thiophene-2,3-diyl or pyrazol-4,5-diyl,
- Q¹ represents oxygen or sulphur,
- Q² represents oxygen or sulphur,
- 10 R¹ represents hydrogen, hydroxyl, amino, represents C₃-C₈-alkylideneamino, represents respectively optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents respectively optionally fluorine-, chlorine- or bromine-substituted propenyl, butenyl, propinyl or butinyl, represents respectively optionally fluorine-,
- 15 chlorine-, cyano-, methoxy- or ethoxy- substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, represents propenyloxy or butenyloxy, represents dimethylamino or diethylamino, represents respectively optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl,
- 20 cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, or represents respectively optionally fluorine-, chlorine-, methyl-, trifluoromethyl- and/or methoxy-substituted phenyl or benzyl,
- R² represents hydrogen, hydroxyl, mercapto, amino, fluorine, chlorine, bromine, represents respectively optionally fluorine-, chlorine-, cyano-, methoxy- or
- 25 ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents respectively optionally fluorine-, chlorine- or bromine-substituted propenyl,

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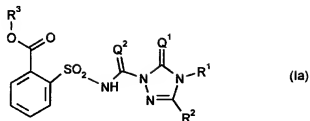
butenyl, propinyl or butinyl, represents respectively optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylthio, ethylthio, n- or i-propylthio, n-, i-, s- or t-butylthio, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, represents propenyloxy, butenyloxy, propinyloxy, butinyloxy, propenylthio, butenylthio, propinylthio, butinylthio, propenylamino, butenylamino, propinylamino, or butinylamino, represents dimethylamino, diethylamino or dipropylamino, represents respectively optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopentenyl, cyclohexenyl, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, cyclopropylthio, cyclobutylthio, cyclopentylthio, cyclohexylthio, cyclopropylamino, cyclobutylamino, cyclopentylamino, cyclohexylamino, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl, cyclohexylmethyl, cyclopropylmethoxy, cyclobutylmethoxy, cyclopentylmethoxy, cyclohexylmethoxy, cyclopropylmethylthio, cyclobutylmethylthio, cyclopentylmethylthio, cyclohexylmethylthio, cyclopropylmethylamino, cyclobutylmethylamino, cyclopentylmethylamino or cyclohexylmethylamino, or represents respectively optionally fluorine-, chlorine-, methyl-, trifluoromethyl- and/or methoxy-substituted phenyl, benzyl, phenoxy, benzyloxy, phenylthio, benzylthio, phenylamino or benzylamino, or represents respectively optionally fluorine-, chlorine-, methyl-, trifluoromethyl- and/or methoxy-substituted oxetanyloxy, furyloxy, tetrahydrofuryloxy, thienyloxy or tetrahydrothienyloxy, or

R¹ and R² together represent optionally branched alkanediyl having 3 to 11 carbon atoms, and

R³ represents respectively optionally fluorine-, chlorine-, methyl- or ethyl-substituted oxetanyl, thietanyl, furyl, tetrahydrofuryl, thienyl or tetrahydrothienyl.

A very particularly preferred group of compounds of the formula (I) are the compounds of the formula (Ia)

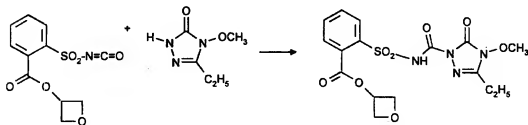
- 10 -



in which

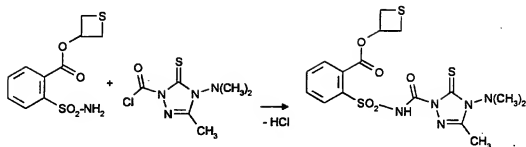
Q^1 , Q^2 , R^1 , R^2 and R^3 each have the meanings given above as being particularly preferred.

- 5 The general or preferred radical definitions listed above are valid both for the end products of the formula (I) and also, in a corresponding manner, for the starting materials or intermediates which are required in each case for the preparation. These radical definitions can be combined with each other at will, i.e. including combinations between the given ranges of preferred compounds.
- 10 Using, for example, 2-(oxetan-3-yl-oxy-carbonyl)-phenylsulfonylisocyanate and 5-ethyl-4-methoxy-2,4-dihydro-3H-1,2,4-triazol-3-one as starting materials, the course of the reaction in the process (a) according to the invention can be illustrated by the following scheme:

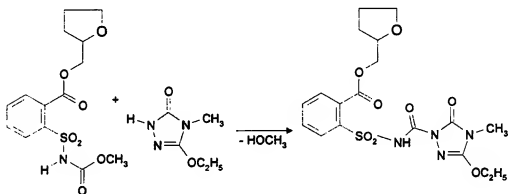


- 15 Using, for example, 2-(thietan-3-yl-oxy-carbonyl)-benzenesulphonamide and 2-chloro-carbonyl-4-dimethylamino-5-methyl-2,4-dihydro-3H-1,2,4-triazol-3-thione as starting materials, the course of the reaction in the process (b) according to the invention can be illustrated by the following scheme:

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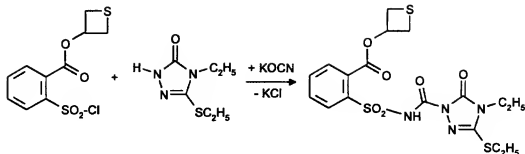


Using, for example, N-methoxycarbonyl-2-(2-(tetrahydrofuryl-methoxy-carbonyl)-benzenesulphonamide and 5-ethoxy-4-methyl-2,4-dihydro-3H-1,2,4-triazol-3-one as starting materials, the course of the reaction in the process (c) according to the invention can be illustrated by the following scheme:



Using, for example, 4-ethyl-5-ethylthio-2,4-dihydro-3H-1,2,4-triazol-3-one and 2-(3-thietanyl-oxy-carbonyl)-benzenesulphonyl chloride and potassium cyanate as starting materials, the course of the reaction in the process (d) according to the invention can be illustrated by the following scheme:

- 12 -



- The formula (II) provides a general definition of the triazolin(e-thio)ones to be used as starting materials in the processes (a), (c) and (d) according to the invention for preparing compounds of the formula (I). In the formula (II), Q¹, R¹ and R² each preferably or in particular have those meanings which have already been given above, in connection with the description of the compounds of the formula (I) according to the invention as being preferred or as being particularly preferred for Q¹, R¹ and R².

- The triazolin(e-thio)ones of the general formula (II) are known and/or can be prepared by processes known per se (cf. Arch. Pharm. 301 (1968), 827; loc. cit. 307 (1974), 889; Bull. Soc. Chim. France 1962, 1365; loc. cit. 1975, 1191; Chem. Ber. 90 (1957), 909-921; loc. cit. 98 (1965), 3025-3099; loc. cit. 102 (1969), 755; J. Heterocycl. Chem. 15 (1978), 237-240; J. Indian Chem. Soc. 6 (1929), 565; Liebigs Ann. Chem. 637 (1960), 135; Monatshefte Chemie 123 (1992), 257; Tetrahedron 32 (1976), 2347-2352; Helv. Chim. Acta 63 (1980), 841-859; J. Chem. Soc. C 1967, 746-751; loc. cit. 1970, 26-34; J. Chem. Soc. Perkin I 1973, 2644; Fen Fak. Derg., Seri A (Ege Univ.) 7 (1984), 1-6 - cited in Chem. Abstracts 101:90846m; EP-A 283876; EP-A 294666; EP-A 298371; EP-A 301946; EP-A 305844; EP-A 341489; EP-A 362633; EP-A 370293; EP-A 391187; EP-A 398096; EP-A 398097; EP-A 399294; EP-A 415196; EP-A 422469; EP-A 425948; EP-A 431291; EP-A 477646; EP-A 502307; EP-A 503437; EP-A 505819; EP-A 511569; EP-A 513621; DE-A 2336827; DE-A 3839206; DE-A 3916208; DE-A 3916930; DD-P 64970; WO-A 93/04050; Preparation Examples).

The formula (III) provides a general definition of the substituted arylsulphonyl iso-(thio)cyanates further to be used as starting materials in the process (a) according to the invention for preparing compounds of the formula (I). In the formula (III) Ar, Q² and

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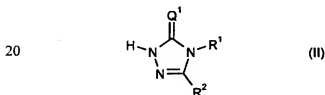
R³ each preferably or in particular have that meaning which has already been given above, in connection with the description of the compounds of the formula (I) according to the invention, as being preferred or as being particularly preferred for Ar, Q² and R³.

- 5 The starting materials of the formula (III) are known and/or can be prepared by processes known per se (cf. EP-A 496701, EP-A 558445).

The formula (IV) provides a general definition of the triazolin(e-thi)one derivatives to be used as starting materials in the process (b) according to the invention for preparing the compounds of the general formula (I). In the formula (IV), Q¹, Q², R¹ and R² each
10 preferably or in particular have those meanings which have already been indicated above, in connection with the description of the compounds of the formula (I), as being preferred or as being particularly preferred for Q¹, Q², R¹ and R²; Z preferably represents fluorine, chlorine, bromine, methoxy, ethoxy, benzyloxy, phenoxy, halogeno- or nitro-phenoxy, in particular methoxy, phenoxy or 4-nitro-phenoxy.

- 15 Some of the starting materials of the formula (IV) have not been disclosed in the literature and form part of the subject matter of commonly assigned earlier patent applications.

The compounds of the general formula (IV) are obtained when triazolin(e-thi)ones of the general formula (II)



in which

Q¹, R¹ and R² are each as defined above

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are reacted with carbonic acid derivatives of the general formula (IX)



in which

Z is as defined above and

- 5 Z¹ represents halogen, alkoxy, aralkoxy or aryloxy (and has the same preferred meanings as Z),

if appropriate in the presence of an acid acceptor such as, for example, sodium hydroxide or potassium hydroxide, sodium t-butoxide or potassium t-butoxide, and if appropriate in the presence of a diluent such as, for example, methylene chloride, 10 tetrahydrofuran or dimethoxyethane and/or water, at temperatures between 0°C and 100°C.

- The formula (V) provides a general definition of the sulphonamides further to be used as starting materials in the process (b) according to the invention for preparing the compounds of the general formula (I). In the formula (V), Ar and R³ each preferably 15 or in particular have that meaning which has already been given above, in connection with the description of the compounds of the formula (I), as being preferred or as being particularly preferred for Ar and R³.

The starting materials of the formula (V) are known and/or can be prepared by processes known per se (cf. EP-A 496701, EP-A 558445).

- 20 The formula (VI) provides a general definition of the substituted arylsulphonamide derivatives to be used as starting materials in the process (c) according to the invention for preparing the compounds of the formula (I). In the formula (VI), Ar, Q² and R³ each preferably or in particular have that meaning which has already been given above, in connection with the description of the compounds of the formula (I), as being

- 15 -

preferred or as being particularly preferred for Ar, Q² and R³; Z preferably represents fluorine, chlorine, bromine, methoxy, ethoxy, benzyloxy, phenoxy, halogeno- or nitro-phenoxy, in particular methoxy, phenoxy or 4-nitro-phenoxy.

- 5 The starting materials of the formula (VI) are known and/or can be prepared by processes known per se.

- 10 The formula (VII) provides a general definition of the substituted arylsulphonyl halides to be used as starting materials in the process (d) according to the invention for preparing the compounds of the formula (I). In the formula (VII), Ar and R³ each preferably or in particular have that meaning which has already been given above, in connection with the description of the compounds of the formula (I), as being preferred or as being particularly preferred for Ar and R³; X preferably represents fluorine, chlorine or bromine, in particular chlorine.

The starting materials of the formula (VII) are known and/or can be prepared by processes known per se (cf. EP-A 496701, EP-A 558445).

- 15 The processes (a), (b), (c) and (d) according to the invention for the preparation of the novel compounds of the formula (I) are preferably carried out using diluents. Suitable diluents in this context are virtually all inert organic solvents. These include, preferably, aliphatic and aromatic, optionally halogenated hydrocarbons such as pentane, hexane, heptane, cyclohexane, petroleum ether, benzene, ligroin, benzene, toluene, xylene, methylene chloride, ethylene chloride, chloroform, tetrachloromethane, 20 chlorobenzene and o-dichlorobenzene; ethers such as diethyl ether and dibutyl ether, glycol dimethyl ether and diglycol dimethyl ether, tetrahydrofuran and dioxane; ketones such as acetone, methyl ethyl ketone, methyl isopropyl ketone and methyl isobutyl ketone; esters such as methyl acetate and ethyl acetate; nitriles, for example acetonitrile 25 and propionitrile; amides, for example dimethylformamide, dimethylacetamide and N-methylpyrrolidone, and also dimethyl sulphoxide, tetramethylene sulphone and hexamethylphosphoric triamide.

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As reaction auxiliaries and/or as acid acceptors in the processes (a), (b), (c) and (d) according to the invention it is possible to employ all acid-binding agents which can customarily be used for such reactions. Preference is given to alkali metal hydroxides, for example sodium hydroxide and potassium hydroxide, alkaline earth metal hydroxides, for example calcium hydroxide, alkali metal carbonates and alkoxides, such as sodium carbonate and potassium carbonate, sodium tert-butoxide and potassium tert-butoxide, and also basic nitrogen compounds, such as trimethylamine, triethylamine, tripropylamine, tributylamine, diisobutylamine, dicyclohexylamine, ethyldiisopropylamine, ethyldicyclohexylamine, N,N-dimethylbenzylamine, N,N-dimethyl-aniline, pyridine, 2-methyl-, 3-methyl-, 4-methyl-, 2,4-dimethyl-, 2,6-dimethyl-, 2-ethyl-, 4-ethyl- and 5-ethyl-2-methyl-pyridine, 1,5-diazabicyclo[4,3,0]-non-5-ene (DBN), 1,8-diazabicyclo-[5,4,0]-undec-7-ene (DBU) and 1,4-diazabicyclo-[2,2,2]-octane (DABCO).

The reaction temperatures in the processes (a), (b), (c) and (d) according to the invention can be varied within a relatively wide range. The reactions are in general carried out at temperatures of between -20°C and +150°C, preferably at temperatures between 0°C and +100°C.

The processes (a), (b), (c) and (d) according to the invention are generally carried out under atmospheric pressure. However, it is also possible to operate under elevated or reduced pressure.

For carrying out processes (a), (b), (c) and (d) according to the invention, the starting materials required in each case are in general employed in approximately equimolar quantities. However, it is also possible to use one of the components employed in each case in a relatively large excess. The reactions are in general carried out in a suitable diluent in the presence of an acid acceptor, and the reaction mixture is stirred for a number of hours at the particular temperature required. Work-up in the processes (a), (b), (c) and (d) according to the invention is in each case carried out by customary methods (cf. the Preparation Examples).

Salts of the compounds of the general formula (I) according to the invention can be

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prepared if desired. Such salts are obtained in a simple manner by customary methods of forming salts, for example by dissolving or dispersing a compound of the formula (I) in an appropriate solvent, for example methylene chloride, acetone, tert-butyl methyl ether or toluene, and adding an appropriate base. The salts can then - if desired after
5 prolonged stirring - be isolated by concentration or filtration with suction.

The active compounds according to the invention can be used as defoliants, desiccants, haulm killers and, especially, as weed-killers. By weeds, in the broadest sense, there are to be understood all plants which grow in locations where they are not wanted. Whether the substances according to the invention act as total or selective herbicides
10 depends essentially on the amount used.

The active compounds according to the invention can be used, for example, in connection with the following plants:

Dicotyledonous weeds of the genera: Sinapis, Lepidium, Galium, Stellaria, Matricaria, Anthemis, Galinsoga, Chenopodium, Urtica, Senecio, Amaranthus, Portulaca,
15 Xanthium, Convolvulus, Ipomoea, Polygonum, Sesbania, Ambrosia, Cirsium, Carduus, Sonchus, Solanum, Rorippa, Rotala, Lindernia, Lamium, Veronica, Abutilon, Emex, Datura, Viola, Galeopsis, Papaver, Centaurea, Trifolium, Ranunculus and Taraxacum.

Dicotyledonous crops of the genera: Gossypium, Glycine, Beta, Daucus, Phaseolus, Pisum, Solanum, Linum, Ipomoea, Vicia, Nicotiana, Lycopersicon, Arachis, Brassica,
20 Lactuca, Cucumis and Cucurbita.

Monocotyledonous weeds of the genera: Echinochloa, Setaria, Panicum, Digitaria, Phleum, Poa, Festuca, Eleusine, Brachiaria, Lolium, Bromus, Avena, Cyperus, Sorghum, Agropyron, Cynodon, Monochoria, Fimbristylis, Sagittaria, Eleocharis, Scirpus, Paspalum, Ischaemum, Sphenoclea, Dactyloctenium, Agrostis, Alopecurus and
25 Apera.

Monocotyledonous crops of the genera: Oryza, Zea, Triticum, Hordeum, Avena,

Secale, Sorghum, Panicum, Saccharum, Ananas, Asparagus and Allium.

However, the use of the active compounds according to the invention is in no way restricted to these genera, but also extends in the same manner to other plants.

5 The compounds are suitable, depending on the concentration, for the total control of weeds, for example on industrial terrain and rail tracks, and on paths and squares with or without tree plantings. Equally, the compounds can be employed for controlling weeds in perennial crops, for example forests, decorative tree plantings, orchards, vineyards, citrus groves, nut orchards, banana plantations, coffee plantations, tea plantations, rubber plantations, oil palm plantations, cocoa plantations, soft fruit
10 plantings and hopfields, in lawns, turf and pasture-land, and for the selective control of weeds in annual crops.

The compounds of the formula (I) according to the invention are particularly suitable for the selective control of monocotyledonous and dicotyledonous weeds in monocotyledonous and dicotyledonous crops, both pre-emergence and post-emergence.

15 The active compounds can be converted into the customary formulations, such as solutions, emulsions, wettable powders, suspensions, powders, dusting agents, pastes, soluble powders, granules, suspo-emulsion concentrates, natural and synthetic materials impregnated with active compound, and very fine capsules in polymeric substances.

20 These formulations are produced in a known manner, for example by mixing the active compounds with extenders, that is liquid solvents and/or solid carriers, optionally with the use of surfactants, that is emulsifiers and/or dispersants and/or foam-formers.

If water is used as extender, it is also possible to use for example organic solvents as auxiliary solvents. Essentially, suitable liquid solvents are the following: aromatics, such as xylene, toluene or alkylnaphthalenes, chlorinated aromatics and chlorinated
25 aliphatic hydrocarbons, such as chlorobenzenes, chloroethylenes or methylene chloride, aliphatic hydrocarbons, such as cyclohexane or paraffins, for example petroleum

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fractions, mineral and vegetable oils, alcohols, such as butanol or glycol and their ethers and esters, ketones, such as acetone, methyl ethyl ketone, methyl isobutyl ketone or cyclohexanone, strongly polar solvents, such as dimethylformamide and dimethyl sulphoxide, and water.

- 5 Suitable solid carriers are:
for example ammonium salts and ground natural minerals, such as kaolins, clays, talc, chalk, quartz, attapulgit, montmorillonite or diatomaceous earth, and ground synthetic minerals, such as finely divided silica, alumina and silicates, suitable solid carriers for granules are: for example crushed and fractionated natural rocks such as calcite,
10 marble, pumice, sepiolite and dolomite, and synthetic granules of inorganic and organic meals, and granules of organic material such as sawdust, coconut shells, maize cobs and tobacco stalks; suitable emulsifiers and/or foam-formers are: for example non-ionic and anionic emulsifiers, such as polyoxyethylene fatty acid esters, polyoxyethylene fatty alcohol ethers, for example alkylaryl polyglycol ethers, alkylsulphonates, alkyl
15 sulphates, arylsulphonates as well as protein hydrolysates; suitable dispersants are: for example lignin-sulphite waste liquors and methylcellulose.

- Tackifiers such as carboxymethylcellulose and natural and synthetic polymers in the form of powders, granules or latices, such as gum arabic, polyvinyl alcohol and polyvinyl acetate, and natural phospholipids, such as cephalins and lecithins, and
20 synthetic phospholipids, can be used in the formulations. Further additives can be mineral and vegetable oils.

- It is possible to use colorants such as inorganic pigments, for example iron oxide, titanium oxide and Prussian Blue, and organic dyes, such as alizarin dyes, azo dyes and metal phthalocyanine dyes, and trace nutrients such as salts of iron, manganese, boron,
25 copper, cobalt, molybdenum and zinc.

The formulations in general comprise between 0.1 and 95 per cent by weight of active compound, preferably between 0.5 and 90%.

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For controlling weeds, the active compounds according to the invention, as such or in the form of their formulations, can also be used as mixtures with known herbicides, ready-to-use formulations or tank mixes being possible.

Possible components for the mixtures are known herbicides, for example anilides, such as diflufenican and propanil; arylcarboxylic acids, such as dichloropicolinic acid, dicamba and picloram; aryloxyalkanoic acids, such as 2,4-D, 2,4-DB, 2,4-DP, fluoroxy-pyr, MCPA, MCPP and triclopyr; aryloxy-phenoxy-alkanoic esters, such as diclofop-methyl, fenoxaprop-ethyl, fluazifop-butyl, haloxyfop-methyl and quizalofop-ethyl; azinones, such as chloridazon and norflurazon; carbamates, such as chlorpropham, 10 desmedipham, phenmedipham and propham; chloroacetanilides, such as alachlor, acetochlor, butachlor, metazachlor, metolachlor, pretilachlor and propachlor; dinitro-anilines, such as oryzalin, pendimethalin and trifluralin; diphenyl ethers, such as acifluorfen, bifenox, fluoroglycofen, fomesafen, halosafen, lactofen and oxyfluorfen; ureas, such as chlorotoluron, diuron, fluometuron, isoproturon, linuron and methabenz-thiazuron; 15 hydroxylamines, such as alloxydim, clethodim, cycloxydim, sethoxydim and tralkoxydim; imidazolinones, such as imazethapyr, imazamethabenz, imazapyr and imazaquin; nitriles, such as bromoxynil, dichlobenil and ioxynil; oxyacetamides, such as mefenacet; sulphonyl-ureas, such as amidosulphuron, bensulphuron-methyl, chlorimuron-ethyl, chlorsulphuron, cinosulphuron, metsulphuron-methyl, nicosulphuron, 20 primisulphuron, pyrazosulphuron-ethyl, thifensulphuron-methyl, triasulphuron and tribenuron-methyl; thiocarbamates, such as butylate, cycloate, diallate, EPTC, esprocarb, molinate, prosulphocarb, thiobencarb and triallate; triazines, such as atrazine, cyanazine, simazine, simetryne, terbutryne and terbutylazine; triazinones, such as hexazinone, metamitron and metribuzin; others, such as aminotriazole, benfuresate, 25 bentazone, cinnethylin, clomazone, clopyralid, defenzoquat, dithiopyr, ethofumesate, fluorchloridone, glufosinate, glyphosate, isoxaben, pyridate, quinchlorac, quinmerac, sulphosate and tridiphan.

Mixtures with other known active compounds, such as fungicides, insecticides, acaricides, nematicides, bird repellents, plant nutrients and agents which improve soil 30 structure, are also possible.

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The active compounds can be used as such, in the form of their formulations or in the use forms prepared therefrom by further dilution, such as ready-to-use solutions, suspensions, emulsions, powders, pastes and granules. They are used in the customary manner, for example by watering, spraying, atomizing or scattering.

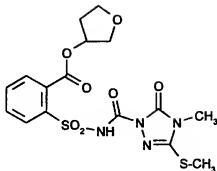
- 5 The active compounds according to the invention can be applied either before or after emergence of the plants. They can also be incorporated into the soil before sowing.

The amount of active compound used can vary within a substantial range. It depends essentially on the nature of the desired effect. In general, the amounts used are between 10 g and 10 kg of active compound per hectare of soil surface, preferably between
10 50 g and 5 kg per ha.

The preparation and use of the active compounds according to the invention can be seen from the examples that follow.

Preparation Examples:

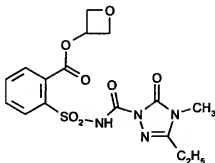
Example 1



(Process (d))

5 A mixture of 2.3 g (8 mmol) of tetrahydrofurfuryl 2-chlorosulphonylbenzoate, 1.2 g (8 mmol) of 4-methyl-5-methylthio-2,4-dihydro-3H-1,2,4-triazol-3-one, 1.0 g (8 mmol) of sodium cyanate and 100 ml of acetonitrile is heated under reflux with stirring for about 15 hours. The mixture is then concentrated using water pump vacuum, the residue is shaken with methylene chloride and aqueous hydrochloric acid (pH 1), and
10 the organic phase is separated off, dried with sodium sulphate and filtered. The filtrate is concentrated using water pump vacuum, the residue is digested with diethyl ether and the crystalline product is isolated by filtration with suction.

0.7 g (20% of theory) of 4-methyl-5-methylthio-2-[2-(tetrahydro-fur-3-yl-oxycarbonyl)-phenylsulphonyl-aminocarbonyl]-2,4-dihydro-3H-1,2,4-triazol-3-one of melting point 160°C is obtained.

Example 2

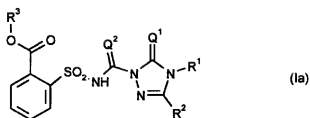
(Process (d))

A mixture of 2.8 g (10 mmol) of oxetan-3-yl 2-chlorosulphonyl-benzoate, 1.3 g
 (10 mmol) of 5-ethyl-4-methyl-2,4-dihydro-3H-1,2,4-triazol-3-one, 1.3 g (20 mmol) of
 sodium cyanate and 50 ml of acetonitrile is heated under reflux for 90 minutes. The
 mixture is subsequently concentrated using water pump vacuum and the residue is
 stirred with methylene chloride and 1N hydrochloric acid. The organic phase is then
 dried with sodium sulphate and filtered. The filtrate is concentrated, the residue is
 digested with isopropanol and the resulting crystalline product is isolated by filtration
 with suction.

1.7 g (41% of theory) of 5-ethyl-4-methyl-2-[2-(oxetan-3-yl-oxycarbonyl)-phenyl-
 sulphonyl-aminocarbonyl]-2,4-dihydro-3H-1,2,4-triazol-3-one of melting point 137°C
 are obtained.

By the methods of Examples 1 and 2 and according to the general description of the
 preparation processes according to the invention, it is also possible to prepare, for
 example, the compounds of the formula (I) and the compounds of the formula (Ia)
 listed in Table 1 below.

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







**Table 1:** Examples of compounds of the formula (1a)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
3	O	O	CH ₃	OC ₂ H ₅		127
4	O	O	CH ₃	n-C ₃ H ₇		
5	O	O	CH ₃	i-C ₃ H ₇		
6	O	O	CH ₃	OCH ₃		
7	O	O	CH ₃	OC ₂ H ₅		148
8	O	O	CH ₃	OC ₃ H _{7-n}		

REPLACEMENT SHEET (RULE 26)











- 25 -

Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
9	O	O	CH ₃	OC ₃ H ₇ -i		
10	O	O	CH ₃	OC ₄ H ₉ -n		
11	O	O	CH ₃	OC ₄ H ₉ -i		
12	O	O	CH ₃	OC ₄ H ₉ -s		
13	O	O	CH ₃	OC ₆ H ₅		
14	O	O	CH ₃	O-CH ₂ -CH=CH ₂		
15	O	O	CH ₃	SCH ₃		123
16	O	O	CH ₃	SC ₂ H ₅		











REPLACEMENT SHEET (RULE 26)

Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
17	O	O	CH ₃	SC ₃ H ₇ -n		
18	O	O	CH ₃	SC ₃ H ₇ -i		
19	O	O	CH ₃	S-CH ₂ -CH=CH ₂		
20	O	O	CH ₃			
21	O	O	CH ₃	SCH ₂ CH ₂ F		
22	O	O	CH ₃	SCH ₂ CHF ₂		
23	O	O	CH ₃	SCH ₂ CF ₃		
24	O	O	CH ₃	N(CH ₃) ₂		
25	O	O	CH ₃	SCH ₂ F		

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








Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
26	O	O	CH ₃	SCH ₂ Cl		
27	O	O	CH ₃	SCH ₂ CH ₂ Cl		
28	O	O	CH ₃	Cl		
29	O	O	CH ₃	Br		
30	O	O	CH ₃	CH ₃		
31	O	O	CH ₃	C ₄ H ₉ -n		
32	O	O	CH ₃			
33	O	O	CH ₃	CH=CH-CH ₃		
34	O	O	CH ₃	CH ₂ OC ₂ H ₅		

REPLACEMENT SHEET (RULE 26)

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








Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
35	O	O	CH ₃	CH ₂ -CH=CH ₂		
36	O	O	CH ₃	CH ₂ OCH ₃		
37	O	O	CH ₃	OCH ₂ CF ₃		
38	O	O	CH ₃	OCH ₂ CHF ₂		
39	O	O	CH ₃	OCH ₂ CF ₂ CHF ₂		
40	O	O	CH ₃			
41	O	O	CH ₃	OCH ₂ CH ₂ OCH ₃		
42	S	O	CH ₃	OC ₂ H ₅		

REPLACEMENT SHEET (RULE 26)

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Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
43	O	S	CH ₃	OC ₂ H ₅		
44	S	S	CH ₃	OC ₂ H ₅		
45	O	O	C ₂ H ₅	OC ₂ H ₅		
46	O	O	C ₂ H ₅	C ₂ H ₅		
47	O	O	C ₂ H ₅	n-C ₃ H ₇		
48	O	O	C ₂ H ₅	i-C ₃ H ₇		
49	O	O	C ₂ H ₅	OCH ₃		
50	O	O	C ₂ H ₅	OC ₂ H ₅		
51	O	O	C ₂ H ₅	OC ₃ H _{7-n}		

REPLACEMENT SHEET (RULE 26)

Table 1: (continued)










Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
52	O	O	C ₂ H ₅	OC ₃ H ₇ -i		
53	O	O	C ₂ H ₅	OC ₄ H ₉ -n		
54	O	O	C ₂ H ₅	OC ₄ H ₉ -i		
55	O	O	C ₂ H ₅	OC ₄ H ₉ -s		
56	O	O	C ₂ H ₅	OC ₆ H ₅		
57	O	O	C ₂ H ₅	O-CH ₂ -CH=CH ₂		
58	O	O	C ₂ H ₅	SCH ₃		
59	O	O	C ₂ H ₅	SC ₂ H ₅		
60	O	O	C ₂ H ₅	SC ₃ H ₇ -n		

Table 1: (continued)
































Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
61	O	O	C ₂ H ₅	SC ₃ H _{7-i}		
62	O	O	C ₂ H ₅	S-CH ₂ -CH=CH ₂		
63	O	O	C ₂ H ₅			
64	O	O	C ₂ H ₅	SCH ₂ CH ₂ F		
65	O	O	C ₂ H ₅	SCH ₂ CHF ₂		
66	O	O	C ₂ H ₅	SCH ₂ CF ₃		
67	O	O	C ₂ H ₅	N(CH ₃) ₂		
68	O	O	C ₂ H ₅	SCH ₂ F		
69	O	O	C ₂ H ₅	SCH ₂ Cl		

Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
70	O	O	C ₂ H ₅	SCH ₂ CH ₂ Cl		
71	O	O	C ₂ H ₅	Cl		
72	O	O	C ₂ H ₅	Br		
73	O	O	C ₂ H ₅	CH ₃		
74	O	O	C ₂ H ₅	C ₄ H _{9-n}		
75	O	O	C ₂ H ₅			
76	O	O	C ₂ H ₅	CH=CH-CH ₃		
77	O	O	C ₂ H ₅	CH ₂ OC ₂ H ₅		
78	O	O	C ₂ H ₅	CH ₂ -CH=CH ₂		

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Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
79	O	O	C ₂ H ₅	CH ₂ OCH ₃		
80	O	O	C ₂ H ₅	OCH ₂ CF ₃		
81	O	O	C ₂ H ₅	OCH ₂ CHF ₂		
82	O	O	C ₂ H ₅	OCH ₂ CF ₂ CHF ₂		
83	O	O	C ₂ H ₅			
84	O	O	C ₂ H ₅	OCH ₂ CH ₂ OCH ₃		
85	S	O	C ₂ H ₅	OC ₂ H ₅		
86	O	S	C ₂ H ₅	OC ₂ H ₅		
87	O	O		OC ₂ H ₅		

REPLACEMENT SHEET (RULE 26)

Table 1: (continued)
























































Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
88	O	O		C ₂ H ₅		
89	O	O		n-C ₃ H ₇		
90	O	O		i-C ₃ H ₇		
91	O	O		OCH ₃		
92	O	O		OC ₂ H ₅		
93	O	O		OC ₃ H _{7-n}		
94	O	O		OC ₃ H _{7-i}		
95	O	O		OC ₄ H _{9-n}		
96	O	O		OC ₄ H _{9-i}		

Table 1: (continued)


















Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
97	O	O		OC ₄ H ₉ -s		
98	O	O		OC ₆ H ₅		
99	O	O		O-CH ₂ -CH=CH ₂		
100	O	O		SCH ₃		
101	O	O		SC ₂ H ₅		
102	O	O		SC ₃ H ₇ -n		
103	O	O		SC ₃ H ₇ -i		
104	O	O		S-CH ₂ -CH=CH ₂		
105	O	O				

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Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
106	O	O		SCH ₂ CH ₂ F		
107	O	O		SCH ₂ CHF ₂		
108	O	O		SCH ₂ CF ₃		
109	O	O		N(CH ₃) ₂		
110	O	O		SCH ₂ F		
111	O	O		SCH ₂ Cl		
112	O	O		SCH ₂ CH ₂ Cl		
113	O	O		Cl		
114	O	O		Br		

















REPLACEMENT SHEET (RULE 26)

Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
115	O	O		CH ₃		
116	O	O		C ₄ H ₉ -n		
117	O	O				
118	O	O		CH=CH-CH ₃		
119	O	O		CH ₂ OC ₂ H ₅		
120	O	O		CH ₂ -CH=CH ₂		
121	O	O		CH ₂ OCH ₃		
122	O	O		OCH ₂ CF ₃		










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Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
123	O	O		OCH ₂ CHF ₂		
5 124	O	O		OCH ₂ CF ₂ CHF ₂		
125	O	O				
126	O	O		OCH ₂ CH ₂ OCH ₃		
127	S	O		OC ₂ H ₅		
128	O	S		OC ₂ H ₅		
10 129	O	O	OCH ₃	OC ₂ H ₅		
130	O	O	OCH ₃	C ₂ H ₅		
131	O	O	OCH ₃	n-C ₃ H ₇		










REPLACEMENT SHEET (RULE 26)

Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
132	O	O	OCH ₃	i-C ₃ H ₇		
5 133	O	O	OCH ₃	OCH ₃		
134	O	O	OCH ₃	OC ₂ H ₅		
135	O	O	OCH ₃	OC ₃ H _{7-n}		
136	O	O	OCH ₃	OC ₃ H _{7-i}		
137	O	O	OCH ₃	OC ₄ H _{9-n}		
10 138	O	O	OCH ₃	OC ₄ H _{9-i}		
139	O	O	OCH ₃	OC ₄ H _{9-s}		
140	O	O	OCH ₃	OC ₆ H ₅		

- 40 -

Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
141	O	O	OCH ₃	O-CH ₂ -CH=CH ₂		
5 142	O	O	OCH ₃	SCH ₃		
143	O	O	OCH ₃	SC ₂ H ₅		
144	O	O	OCH ₃	SC ₃ H _{7-n}		
145	O	O	OCH ₃	SC ₃ H _{7-i}		
146	O	O	OCH ₃	S-CH ₂ -CH=CH ₂		
10 147	O	O	OCH ₃			
148	O	O	OCH ₃	SCH ₂ CH ₂ F		

REPLACEMENT SHEET (RULE 26)

Table 1: (continued)










Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
149	O	O	OCH ₂	SCH ₂ CHF ₂		
5 150	O	O	OCH ₃	SCH ₂ CF ₃		
151	O	O	OCH ₃	N(CH ₃) ₂		
152	O	O	OCH ₃	SCH ₂ F		
153	O	O	OCH ₃	SCH ₂ Cl		
154	O	O	OCH ₃	SCH ₂ CH ₂ Cl		
10 155	O	O	OCH ₃	Cl		
156	O	O	OCH ₃	Br		
157	O	O	OCH ₃	CH ₃		

Table 1: (continued)











Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³
158	O	O	OCH ₃	C ₄ H ₉ -n	
5 159	O	O	OCH ₃		
160	O	O	OCH ₃	CH=CH-CH ₃	
161	O	O	OCH ₃	CH ₂ OC ₂ H ₅	
162	O	O	OCH ₃	CH ₂ -CH=CH ₂	
163	O	O	OCH ₃	CH ₂ OCH ₃	
10 164	O	O	OCH ₃	OCH ₂ CF ₃	
165	O	O	OCH ₃	OCH ₂ CHF ₂	
166	O	O	OCH ₃	OCH ₂ CF ₂ CHF ₂	

Table 1: (continued)






























Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³
167	O	O	OCH ₃		
5 168	O	O	OCH ₃	OCH ₂ CH ₂ - OCH ₃	
169	S	O	OCH ₃	OC ₂ H ₅	
170	O	S	OCH ₃	OC ₂ H ₅	
171	O	O	OC ₂ H ₅	OC ₂ H ₅	
172	O	O	OC ₂ H ₅	C ₂ H ₅	
10 173	O	O	OC ₂ H ₅	n-C ₃ H ₇	
174	O	O	OC ₂ H ₅	i-C ₃ H ₇	
175	O	O	OC ₂ H ₅	OCH ₃	

Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³
176	O	O	OC ₂ H ₅	OC ₂ H ₅	
5 177	O	O	OC ₂ H ₅	OC ₃ H _{7-n}	
178	O	O	OC ₂ H ₅	OC ₃ H _{7-i}	
179	O	O	OC ₂ H ₅	SCH ₃	
180	O	O	OC ₂ H ₅	SC ₂ H ₅	
181	O	O	OC ₂ H ₅	N(CH ₃) ₂	
10 182	O	O	OC ₂ H ₅	SCH ₂ F	
183	O	O	OC ₂ H ₅	SCH ₂ Cl	
184	O	O	OC ₂ H ₅	SCH ₂ CH ₂ Cl	








- 45 -

Table 1: (continued)

Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
185	O	O	OC ₂ H ₅	Cl		
5 186	O	O	OC ₂ H ₅	Br		
187	O	O	OC ₂ H ₅	CH ₃		
188	O	O	OC ₂ H ₅			
189	O	O	OC ₂ H ₅	CH=CH-CH ₃		
190	O	O	OC ₂ H ₅	CH ₂ OC ₂ H ₅		
10 191	O	O	OC ₂ H ₅	CH ₂ -CH=CH ₂		
192	O	O	OC ₂ H ₅	CH ₂ OCH ₃		
193	O	O	N(CH ₃) ₂	C ₂ H ₅		

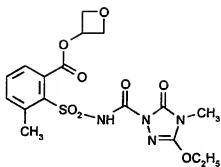
- 46 -

Table 1: (continued)

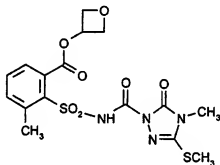
Ex. No.	Q ¹	Q ²	R ¹	R ²	R ³	Melting point (°C)
194	O	O	N(CH ₃) ₂	n-C ₃ H ₇		
5 195	O	O	N(CH ₃) ₂	CH ₃		
196	O	O	N(CH ₃) ₂	OCH ₃		
197	O	O	N(CH ₃) ₂	OC ₂ H ₅		
198	O	O	N(CH ₃) ₂	OC ₃ H _{7-n}		
199	O	O	N(CH ₃) ₂	SCH ₃		
10 200	O	O	CH ₃	C ₂ H ₅		159

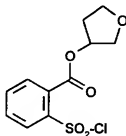
By the methods of Examples 1 and 2, it was also possible to prepare the following compounds:

- 47 -

Example 201Melting point: 146°C **Example 202**

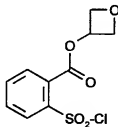
5

Melting point: 158°C

Starting materials of the formula (VII):Example (VII-1)

- At -10°C, a solution of 3.4 g of pyridine in 20 ml of methylene chloride is added dropwise with stirring to a mixture of 9.46 g (39 mmol) of 2-chlorosulphonyl-benzoyl chloride, 3.5 g (39 mmol) of 3-hydroxymethyl-tetrahydrofuran and 100 ml of methylene chloride, and the reaction mixture is then stirred at 20°C for about 6 hours. The mixture is subsequently concentrated using water pump vacuum, the residue is shaken with methylene chloride and aqueous hydrochloric acid (pH 1), and the organic phase is separated off, dried with sodium sulphate and filtered. The solvent is carefully distilled off from the filtrate using water pump vacuum.

8.2 g (72.5% of theory) of tetrahydrofur-3-yl 2-chlorosulphonyl-benzoate are obtained as an oily residue which can be used directly as such for further reactions.

Example (VII-2)Step 1

- 49 -

A mixture of 68.3 g (0.20 mol) of bis-(2-chlorocarbonyl-phenyl) disulphide, 29.6 g (0.40 mol) of 3-hydroxy-oxetane, 42.5 g (0.42 mol) of triethylamine and 500 ml of methylene chloride is stirred at 20°C for 15 hours. 200 ml of 1N hydrochloric acid are then added and the organic phase is separated off, washed with water, dried with sodium sulphate and filtered. The filtrate is concentrated using water pump vacuum, the residue is digested with diethyl ether and the resulting crystalline product is isolated by filtration with suction.

48.6 g (58% of theory) of bis-[2-(oxetan-3-yl-oxycarbonyl)-phenyl] disulphide of melting point 143°C are obtained.

10 Step 2

At -5°C to 0°C, 11.2 g of chlorine are introduced over a period of about 15 minutes into a mixture of 10.5 g (25 mmol) of bis-[2-(oxetan-3-yl-oxycarbonyl)-phenyl] disulphide, 12.9 g of sodium acetate and 100 ml of 50% strength aqueous acetic acid. The reaction mixture is stirred at 0°C for a further 15 minutes and then admixed with 150 ml of methylene chloride. The methylene chloride phase is then separated off, washed with ice-water, dried with sodium sulphate and filtered. The filtrate is concentrated using water pump vacuum and the residue is purified twice by silica gel column chromatography (first run with methylene chloride, second run with ethyl acetate). 10.4 g (75% of theory) of oxetan-3-yl 2-chlorosulphonyl-benzoate are obtained as a yellowish oil.

¹H NMR (CDCl₃, TMS, δ): 4.9 (m, 2H), 5.0 (m, 2H), 5.8 (m, 1H), 7.8 (m, 3H), 8.2 (m, 1H) ppm.

- 50 -

Use examples:Example A

Pre-emergence test

- Solvent: 5 parts by weight of acetone
- 5 Emulsifier: 1 part by weight of alkylaryl polyglycol ether

To produce a suitable active compound preparation, 1 part by weight of active compound is mixed with the stated amount of solvent, the stated amount of emulsifier is added and the concentrate is diluted with water to the desired concentration.

- 10 Seeds of the test plants are sown in normal soil. After about 24 hours, the soil is watered with the preparation of active compound. It is advantageous to keep the amount of water per unit area constant. The concentration of the active compound in the preparation is immaterial, only the amount of active compound applied per unit area matters.

- 15 After three weeks, the degree of damage to the plants is rated in % damage by comparison with the development of the untreated control.

The figures denote:

- 0% = no effect (like untreated control)
- 100% = total destruction

- 20 In this test, the compounds of the formula (I) according to the invention show strong activity against weeds (cf. Table A).

Example B

Post-emergence test

Solvent: 5 parts by weight of acetone

Emulsifier: 1 part by weight of alkylaryl polyglycol ether

- 5 To produce a suitable active compound preparation, 1 part by weight of active compound is mixed with the stated amount of solvent, the stated amount of emulsifier is added and the concentrate is diluted with water to the desired concentration.

10 Test plants which have a height of 5-15 cm are sprayed with the preparation of the active compound in such a way as to apply the particular amounts of active compound desired per unit area. The concentration of the spray liquor is chosen so that the particular amounts of active compound desired are applied in 1000 l of water/ha.

After three weeks, the degree of damage to the plants is rated in % damage by comparison with the development of the untreated control.

The figures denote:

- 15 0% = no effect (like untreated control)
 100% = total destruction

In this test, the compounds of the formula (I) according to the invention show strong activity against weeds (cf. Table B).

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Table A: Pre-emergence test/greenhouse

5

Active compound (according to Preparation Ex.)	Application rate (g/ha)	Maize	Alopecurus	Cyperus	Setaria	Amaranthus	Sinapis
(7)	250	10	80	-	70	100	-
(201)	250	-	80	95	80	70	100
(202)	250	0	80	100	70	-	70

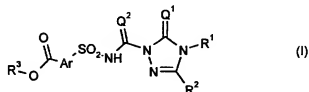
10 **Table B:** Post-emergence test/greenhouse

15

Active compound (according to Preparation Ex.)	Application rate (g/ha)	Maize	Alopecurus	Avena fatua	Sinapis
(201)	250	10	80	80	100

Patent Claims

1. Substituted arsulphonylamino(thio)carbonyltriazolin(e-thi)ones of the general formula (I)



5 in which

Ar represents respectively optionally substituted arylene or heteroarylene,

Q¹ represents oxygen or sulphur,

Q² represents oxygen or sulphur,

10 R¹ represents hydrogen, hydroxyl, amino, alkylideneamino or represents a respectively optionally substituted radical from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkylamino, dialkylamino, alkanoylamino, cycloalkyl, cycloalkylalkyl, aryl, arylalkyl,

15 R² represents hydrogen, hydroxyl, mercapto, amino, halogen or represents a respectively optionally substituted radical from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, alkenyloxy, alkynyloxy, alkylthio, alkenylthio, alkynylthio, alkylamino, alkenylamino, alkynylamino, dialkylamino, alkanoylamino, aziridino, pyrrolidino, piperidino, morpholino, cycloalkyl, cycloalkenyl, cycloalkyloxy, cycloalkylthio, cycloalkylamino, cycloalkylalkyl, cycloalkylalkoxy, cycloalkylalkylthio, cycloalkylalkylamino, aryl, 20 aryloxy, arylthio, arylamino, arylalkyl, arylalkoxy, arylalkylthio, arylalkylamino, heterocyclyloxy, heterocyclylthio, or

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R¹ and R² together represent optionally branched alkanediyl, and

R³ represents optionally substituted heterocyclyl,

and salts of the compounds of the formula (I).

2. Compounds of the formula (I) according to Claim 1, characterized in that in
5 them

Ar represents phenylene or naphthylene, each of which is optionally substituted by halogen, cyano, nitro, by C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-alkylthio, C₁-C₄-alkylsulphinyl, C₁-C₄-alkylsulphonyl, di-(C₁-C₄-alkyl)-amino-sulphonyl or N-C₁-C₄-alkoxy-N-C₁-C₄-alkyl-amino-sulphonyl (each
10 of which is optionally substituted by fluorine and/or chlorine), or represents heteroarylene of 5 or 6 ring members, at least one of which is oxygen, sulphur or nitrogen and one or two more are optionally nitrogen, which is optionally substituted by halogen, cyano, nitro, by C₁-C₄-alkyl or C₁-C₄-alkoxy (each of which is optionally substituted by fluorine and/or chlorine),

15 Q¹ represents oxygen or sulphur,

Q² represents oxygen or sulphur,

R¹ represents hydrogen, hydroxyl, amino, represents C₂-C₁₀-alkylideneamino, represents optionally fluorine-, chlorine-, bromine-, cyano-, C₁-C₄-alkoxy-, C₁-C₄-alkyl-carbonyl- or C₁-C₄-alkoxy-carbonyl-substituted C₁-C₆-alkyl,
20 represents respectively optionally fluorine-, chlorine- and/or bromine-substituted C₂-C₆-alkenyl or C₂-C₆-alkinyl, represents respectively optionally fluorine-, chlorine-, cyano-, C₁-C₄-alkoxy- or C₁-C₄-alkoxy-carbonyl-substituted C₁-C₆-alkoxy, C₁-C₆-alkylamino or C₁-C₆-alkanoylamino, represents C₃-C₆-alkenyloxy, represents di-(C₁-C₄-alkyl)-amino, represents
25 respectively optionally fluorine-, chlorine-, bromine-, cyano- and/or C₁-C₄-

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alkyl-substituted C₃-C₆-cycloalkyl or C₃-C₆-cycloalkyl-C₁-C₄-alkyl, or represents respectively optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C₁-C₄-alkyl-, trifluoromethyl- and/or C₁-C₄-alkoxy-substituted phenyl or phenyl-C₁-C₄-alkyl,

5 R² represents hydrogen, hydroxyl, mercapto, amino, fluorine, chlorine, bromine, iodine, represents optionally fluorine-, chlorine-, bromine-, cyano-, C₁-C₄-alkoxy-, C₁-C₄-alkyl-carbonyl- or C₁-C₄-alkoxy-carbonyl-substituted C₁-C₆-alkyl, represents respectively optionally fluorine-, chlorine- and/or bromine-substituted C₂-C₆-alkenyl or C₂-C₆-alkinyl, represents respectively
 10 optionally fluorine-, chlorine-, cyano-, C₁-C₄-alkoxy- or C₁-C₄-alkoxy-carbonyl-substituted C₁-C₆-alkoxy, C₁-C₆-alkylthio, C₁-C₆-alkylamino or C₁-C₆-alkanoylamino, represents C₂-C₆-alkenyloxy, C₂-C₆-alkinyloxy, C₂-C₆-alkenylthio, C₂-C₆-alkinylthio, C₂-C₆-alkenylamino or C₂-C₆-alkinylamino, represents di-(C₁-C₄-alkyl)-amino, represents respectively optionally methyl-
 15 and/or ethyl-substituted aziridino, pyrrolidino, piperidino or morpholino, represents respectively optionally fluorine-, chlorine-, bromine-, cyano- and/or C₁-C₄-alkyl-substituted C₃-C₆-cycloalkyl, C₃-C₆-cycloalkenyl, C₃-C₆-cycloalkyloxy, C₃-C₆-cycloalkylthio, C₃-C₆-cycloalkylamino, C₃-C₆-cycloalkyl-C₁-C₄-alkyl, C₃-C₆-cycloalkyl-C₁-C₄-alkoxy, C₃-C₆-cycloalkyl-C₁-
 20 C₄-alkylthio or C₃-C₆-cycloalkyl-C₁-C₄-alkylamino, or represents respectively optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C₁-C₄-alkyl-, trifluoromethyl- and/or C₁-C₄-alkoxy-substituted substituted phenyl, phenyl-C₁-C₄-alkyl, phenoxy, phenyl-C₁-C₄-alkoxy, phenylthio, phenyl-C₁-C₄-alkylthio, phenylamino or phenyl-C₁-C₄-alkylamino, or represents
 25 respectively optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, C₁-C₄-alkyl-, trifluoromethyl- and/or C₁-C₄-alkoxy-substituted heterocycloxy or heterocyclythio, the heterocyclyl component being in each case selected from the group consisting of oxiranyl, oxetanyl, furyl, tetrahydrofuryl, thietanyl, thienyl, tetrahydrothienyl, or

30 R¹ and R² together represent optionally branched alkanediyl having 3 to 11

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carbon atoms, and

R³ represents respectively optionally halogen- or C₁-C₄-alkyl-substituted oxetanyl, thietanyl, furyl, tetrahydrofuryl, thienyl or tetrahydrothienyl,

5 and the sodium, potassium, magnesium, calcium, ammonium, C₁-C₄-alkyl-ammonium, di-(C₁-C₄-alkyl)-ammonium, tri-(C₁-C₄-alkyl)-ammonium, tetra-(C₁-C₄-alkyl)-ammonium, tri-(C₁-C₄-alkyl)-sulphonium, C₅- or C₆-cycloalkyl-ammonium and di-(C₁-C₂-alkyl)-benzyl-ammonium salts of compounds of the formula (I).

10 3. Compounds of the formula (I) according to Claim 1, characterized in that in them

Ar represents respectively optionally fluorine-, chlorine-, bromine-, cyano-, nitro-, methyl-, ethyl-, n- or i-propyl-, trifluoromethyl-, methoxy-, ethoxy-, difluoromethoxy-, trifluoromethoxy-, methylthio- or ethylthio-substituted 1,2-phenylene (ortho-phenylene), pyridine-2,3-diyl, thiophene-2,3-diyl or pyrazol-4,5-diyl,

Q¹ represents oxygen or sulphur,

Q² represents oxygen or sulphur,

20 R¹ represents hydrogen, hydroxyl, amino, represents C₃-C₈-alkylideneamino, represents respectively optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents respectively optionally fluorine-, chlorine- or bromine-substituted propenyl, butenyl, propinyl or butinyl, represents respectively optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylamino, ethylamino, n- or i-propylamino, n-, i-, s- or t-butylamino, represents propenyloxy or

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5 butenyloxy, represents dimethylamino or diethylamino, represents respectively optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl or cyclohexylmethyl, or represents respectively optionally fluorine-, chlorine-, methyl-, trifluoromethyl- and/or methoxy-substituted phenyl or benzyl

10 R^2 represents hydrogen, hydroxyl, mercapto, amino, fluorine, chlorine, bromine, represents respectively optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, represents respectively optionally fluorine-, chlorine- or bromine-substituted propenyl, butenyl, propinyl or butinyl, represents respectively optionally fluorine-, chlorine-, cyano-, methoxy- or ethoxy-substituted methoxy, ethoxy, n- or i-propoxy, n-, i-, s- or t-butoxy, methylthio, ethylthio, n- or i-propylthio, n-, i-, s- or t-butylthio, methylamino, ethylamino, 15 n- or i-propylamino, n-, i-, s- or t-butylamino, represents propenyloxy, butenyloxy, propinyloxy, butinyloxy, propenylthio, butenylthio, propinylthio, butinylthio, propenylamino, butenylamino, propinylamino, or butinylamino, represents dimethylamino, diethylamino or dipropylamino, represents respectively optionally fluorine-, chlorine-, methyl- and/or ethyl-substituted cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopentenyl, 20 cyclohexenyl, cyclopropyloxy, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, cyclopropylthio, cyclobutylthio, cyclopentylthio, cyclohexylthio, cyclopropylamino, cyclobutylamino, cyclopentylamino, cyclohexylamino, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl, cyclohexylmethyl, cyclopropylmethoxy, cyclobutylmethoxy, cyclopentylmethoxy, cyclohexylmethoxy, cyclopropylmethylthio, cyclobutylmethylthio, cyclopentylmethylthio, 25 cyclohexylmethylthio, cyclopropylmethylamino, cyclobutylmethylamino, cyclopentylmethylamino or cyclohexylmethylamino, or represents respectively optionally fluorine-, chlorine-, methyl-, trifluoromethyl- and/or methoxy-substituted phenyl, benzyl, phenoxy, benzyloxy, phenylthio, 30 benzylthio, phenylamino or benzylamino, or represents respectively

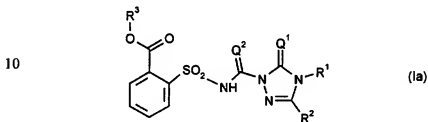
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optionally fluorine-, chlorine-, methyl-, trifluoromethyl- and/or methoxy-substituted oxetanyloxy, furyloxy, tetrahydrofuryloxy, thienyloxy or tetrahydrothienyloxy, or

- 5 R^1 and R^2 together represent optionally branched alkanediyl having 3 to 11 carbon atoms, and

R^3 represents respectively optionally fluorine-, chlorine-, methyl- or ethyl-substituted oxetanyl, thietanyl, furyl, tetrahydrofuryl, thienyl or tetrahydrothienyl.

4. Compounds of the formula (Ia)

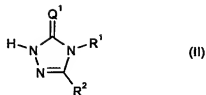


in which

Q^1 , Q^2 , R^1 , R^2 and R^3 are each as defined in Claim 3.

5. Process for preparing compounds of the formula (I) according to Claim 1, characterized in that
- 15 (a) triazolin(e-thi)ones of the general formula (II)

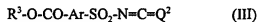
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in which

Q^1 , R^1 and R^2 are each as defined in Claim 1

are reacted with substituted arylsulphonyliso(thio)cyanates of the general
5 formula (III)



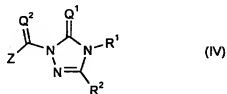
in which

Ar , Q^2 and R^3 are each as defined in Claim 1,

if appropriate in the presence of a reaction auxiliary and if appropriate in the
10 presence of a diluent,

or

(b) triazolin(e-thi)one derivatives of the general formula (IV)



in which

15 Q^1 , Q^2 , R^1 and R^2 are each as defined above and

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Z represents halogen, alkoxy, aryloxy or arylalkoxy

are reacted with sulphonamides of the general formula (V)



in which

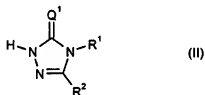
5 Ar and R³ are each as defined above,

if appropriate in the presence of an acid acceptor and if appropriate in the presence of a diluent,

or

(c) triazolin(e-thi)ones of the general formula (II)

10



in which

Q¹, R¹ and R² are each as defined above

are reacted with substituted arylsulphonamide derivatives of the general formula (VI)

15



in which

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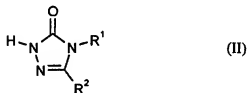
Ar, Q² and R³ are each as defined above and

Z represents represents halogen, alkoxy, aryloxy or arylalkoxy,

if appropriate in the presence of an acid acceptor and if appropriate in the presence of a diluent,

5 or

(d) triazolin(e-thi)ones of the general formula (II)



in which

Q¹, R¹ and R² are each as defined above

10 are reacted with substituted arylsulphonyl halides of the general formula (VII)



in which

Ar and R³ are each as defined above and

X represents halogen

15 and metal (thio)cyanates of the general formula (VIII)



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in which

Q^2 is as defined above and

M represents an alkali metal or an alkaline earth metal equivalent,

5 if appropriate in the presence of a reaction auxiliary and if appropriate in the presence of a diluent,

and, if appropriate, the compounds of the formula (I) obtained by the processes (a), (b), (c) or (d) are converted into salts by customary methods.

6. Herbicides, characterized in that they comprise at least one compound of the formula (I) of a salt thereof according to Claim 1.
- 10 7. Use of compounds of the general formula (I) or salts thereof according to Claim 1 for controlling undesirable vegetation.
8. Method for controlling weeds, characterized in that compounds of the general formula (I) or salts thereof according to Claim 1 are allowed to act on the weeds or their habitat.
- 15 9. Process for preparing herbicides, characterized in that compounds of the general formula (I) or salts thereof according to Claim 1 are mixed with extenders and/or surfactants.

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